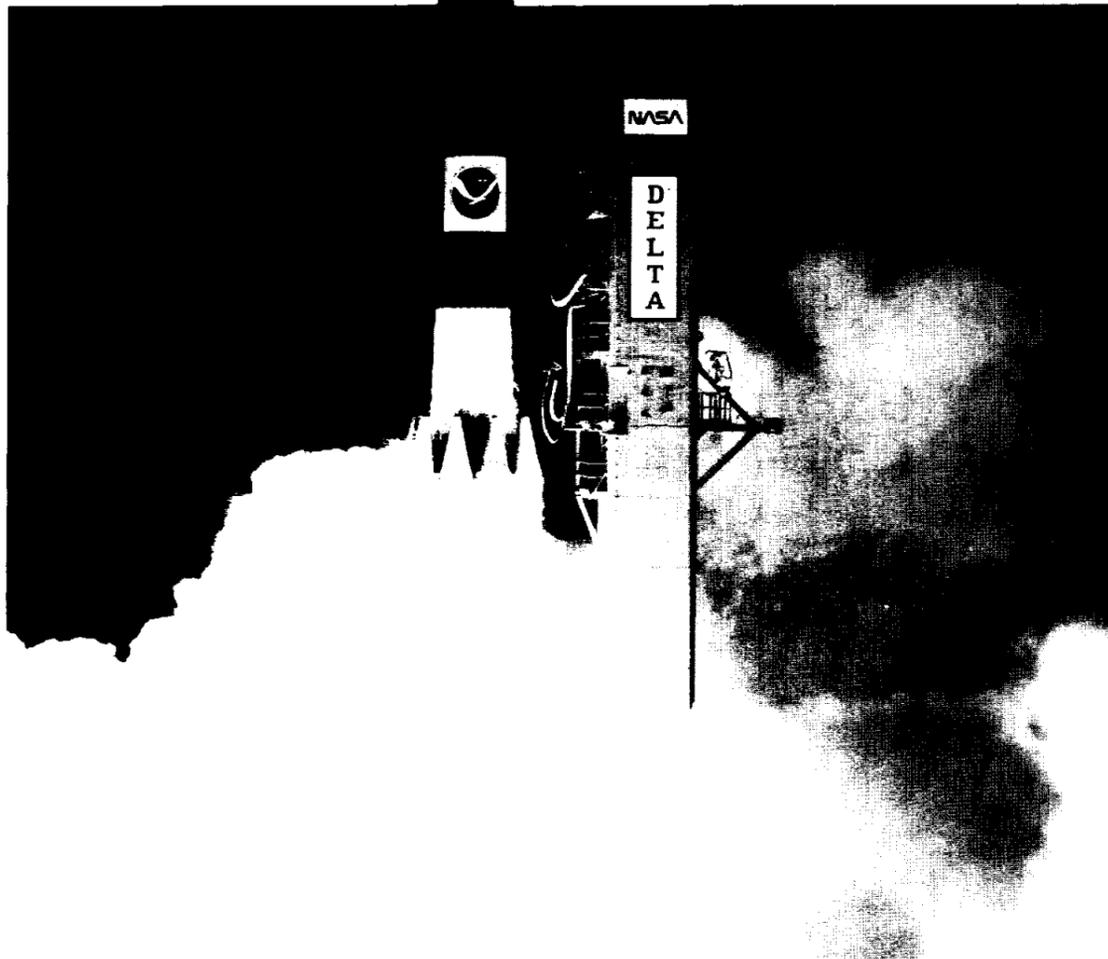


Space News Roundup

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National Aeronautics and Space Administration



Delta 179 lifts off from Launch Complex 17 Feb. 26 in the first NASA launch of 1987.

Delta successfully launches GOES-7

Delta 179 successfully launched a Geostationary Operational Environmental Satellite (GOES) from Cape Canaveral Air Force Station Feb. 26.

GOES-H, a second and very important eye in the sky for the National Oceanic and Atmospheric Administration, was launched aboard a McDonnell Douglas Delta-3924 from Launch Complex 17. The satellite will be designated GOES-7 once on station.

The satellite is the seventh in the GOES series and 10th weather satellite for NOAA since 1974 for transmitting cloud cover images from geosynchronous Earth orbit (GEO).

In addition to providing cloud cover images and atmospheric temperature profiles, or soundings, GOES-H will collect space environment data and conduct an experiment for detecting emergency distress signals on the ground from GEO.

GOES-H will drift to its checkout point at 80 degrees west longitude by the first week in March and remain there for about three weeks. Then controllers will start drifting the satellite toward its permanent

location at 75 degrees west longitude. GOES will arrive on station at the end of March and be handed over from NASA to NOAA. Operational images are expected to begin flowing from the satellite at that time.

At its position at 75 degrees west longitude, it will become known as GOES East, providing primary weather coverage for the east coast of the United States. A twin satellite, GOES-6, has been providing a centralized view of the U.S. since GOES-5 failed in 1985. GOES-6, now located at 98 degrees west, was unable to provide coverage of hurricane formation off Africa. When GOES-7 is operational, the GOES-6 satellite will be moved back to its original position at 135 degrees west longitude to provide coverage of the west coast of the United States and the mid Pacific Ocean region.

The launch of Delta 179 was postponed twice in the days prior to launch Feb. 26. The first attempt was scrubbed while engineers worked to overcome a leaking main engine fuel valve seal. The second attempt was postponed Feb. 25 due to excessive wind shear aloft.

NASA and Morton Thiokol reach preliminary understanding

NASA and Morton Thiokol, Inc. have reached a preliminary understanding on resolution of contractual issues resulting from the *Challenger* accident and on restructuring of the Space Shuttle solid rocket motor contract.

As a result of the negotiations, Morton Thiokol has voluntarily accepted a \$10 million reduction in the profit it earns under the contract. As a result of this reduction, NASA said, it is unnecessary for the Agency to further consider a levy of the fee penalty.

In addition, Morton Thiokol will

perform, at no profit, approximately \$409 million worth of work required to fix the faulty joints, rework existing hardware to include the design fix and replace the reusable motor hardware lost in the *Challenger* accident.

The contract work remaining at the time of the accident, plus additional work ordered by NASA for safety and reliability enhancements on motor parts not connected with the accident, will be performed by Morton Thiokol under the restructured contract.

This portion of the work effort

will cost approximately \$487 million. Morton Thiokol's profits for this work will be based on its performance in areas such as quality, technical performance, schedule, business management and cost control.

This work will bring the total contract cost to approximately \$1.3 billion. Morton Thiokol already had completed about \$418 million worth of work under its contract at the time of the *Challenger* accident. The maximum potential profit Morton Thiokol can earn for the total effort will be \$86 million. To

date, about \$41 million in profit payments have been made.

It is expected that a contract modification, reflecting this understanding, will be signed by October, following submission and negotiation of Morton Thiokol's detailed proposal.

"Both NASA and Morton Thiokol believed it was in the best interest of all concerned to resolve the matters without resorting to lengthy and expensive litigation that also could have diverted attention from the critical national priority of safely returning the Shuttle to flight," a

NASA Headquarters statement said.

Officials of Morton Thiokol's Aerospace Group, prime contractor for solid rocket motors, and the Marshall Space Flight Center, which manages the motor program for NASA, have been negotiating since last summer. Topics discussed included a \$10 million fee penalty provision of the contract, work necessary to fix the design defects in the motor joints, new work required due to NASA-directed safety and reliability enhancements in the motor and restructuring the remainder of the contract.

A close call

Two uninjured after emergency T-38 landing in California

Pilots know that practice makes perfect, and Rob Rivers has recent evidence to underscore the point.

Rivers, a research pilot and aerospace engineer in the Aircraft Operations Division since October 1986, concluded a routine checkout flight in a T-38 Talon on Feb. 23 with a series of simulated no-flap approaches and one-engine approaches to Ellington Field. He thought he could use the practice, he said.

The next day, he was flying a T-38 into Los Angeles with one engine out, the other on fire and the cockpit filling with smoke. "I guess from a seat-of-the-pants aspect, I was happy I had practiced the day before," Rivers said.

He and Astronaut Brewster H. Shaw, Col., USAF, were in NASA 914, bound for Los Alamitos Army Air Field southeast of Los Angeles (the field was formerly known as Los Alamitos Naval Air Station) when a bright flash erupted in front of the canopy of the twin-engine jet.

They were about 10 miles out over the Pacific on the northbound leg of their approach. Rivers, who was flying in the front seat, felt a shock on his right hand, which was



A T-38 Talon in flight.

on the throttle. There was a loud bang, then a jolt.

"I turned toward shore and asked for an emergency approach," Rivers recalled. "The rear cockpit began filling up with smoke. I began shutting down the electrical system, turning off the generator, radio and other systems, and left one VHF radio on. That meant we had to do a VFR (visual flight rules, or, with no instruments) landing. Col. Shaw, who has flown into Los

Alamitos more often than I have, took the stick and pointed the nose in the right direction."

Rivers said they soon felt a second jolt, followed by a warning light indicating a fire in the right engine. They declared an emergency, telling the ground that the aircraft was on fire.

"As we crossed the coast, we got a left engine fire light. We were over land, over densely populated areas, and the field was in sight,"

Rivers said.

Because of the danger to underlying areas, and because hydraulic power for a T-38 is supplied by the engines, shutting down the left engine was not a viable option, Rivers said, and ejecting is always a last resort. "The aircraft was flying fine. That's the big reason why we stayed with it."

The potential danger to populated areas if they did have to eject was one reason why they flew in over

the Seal Beach Naval Weapons Storage Area. "The aircraft could have impacted there with less danger to people if we'd had to eject," Rivers said.

They were able to stay with the aircraft, however, and after touchdown Rivers cut power to the left engine. "We rolled out, came to a stop and raised the canopy. I looked over my left shoulder and saw a big fire in the back of the aircraft."

Shaw got out first, and came back to help Rivers when his feet got hung up in his oxygen line. From the rear of the canopy back to the vertical stabilizer was one big gaping hole. "All the fuel in the airplane was burning," Rivers said.

The T-38, built by the Northrop Corp., first flew in 1959 at Edwards Air Force Base. It was a direct outgrowth of Northrop's N-156 program and later derivatives were the F-5 and the F-20 Tigershark. The Talon was selected by NASA in 1964 as an astronaut proficiency maintenance aircraft, and also is used in some research and development roles. With the loss of NASA 914, there are now 25 T-38s at Ellington.

An investigation board is now studying the incident.

Bulletin Board

Aerospace computer security papers sought

Technical papers, panel concepts and tutorials that address the application of computer security technologies in aerospace are being solicited for the Third Aerospace Computer Security Conference. The conference, scheduled for Dec. 8-11, 1987, at the Sheraton World Hotel in Orlando, Fla., is sponsored by the American Institute of Aeronautics and Astronautics (AIAA), the American Society for Industrial Security and the IEEE Computer Society. Areas of interest include trusted DBMSs and operating systems, network security, Space Station requirements, languages and verification tools, policy and management issues, advanced technologies, C3I systems, SDI issues and requirements, risk/threat assessments, and data privacy and integrity. Classified sessions at the secret level are planned. Unclassified copies of final abstracts of approximately 1,000 words must be mailed before May 20. For more information, contact Sharon Graybill at 333-2957.

Brown bag topics scheduled

Upcoming topics for the weekly JSC Astronomy Club brown bag seminars include discussions of OMV operations to support Space Station spacecraft servicing, led by Jerry Bell on March 11, and comet showers and biological extinctions, led by Dr. Paul Weissman of JPL on March 18. The discussions are conducted every Wednesday from noon to 1 p.m. in Bldg. 31, Conference Rm. 193. For more information, call Al Jackson at CSC, 280-2296.

Terraforming-II looks at planet building, refurbishing

The future role of human technology in preserving the Earth's current climate, and in restoring and enhancing the habitability of neighboring worlds through "terraforming" will be discussed at 7 p.m. Wednesday, March 18 in the Lunar and Planetary Institute's Berkner Room. Hans Mark is scheduled as keynote speaker. Formal papers and a panel discussion will complete the colloquium. For more information, contact Jim Oberg, 337-2838.

JAIPCC mini-symposium slated for March 12

The sixth annual Joint Application in Instrumentation, Process and Computer Control (JAIPCC '87) will feature a keynote speech by Dr. Wendell Mendell on "The Role of American Industry Infrastructure in the Development of Lunar Bases and Space Activities of the 21st Century." The all-day mini-symposium, sponsored by the Clear Lake-Galveston Section of the Instrument Society of America (ISA), the Galveston Bay Section of the Institute of Electrical and Electronic Engineers (IEEE) and the University of Houston-Clear Lake, begins at 8 a.m. March 12 on the university campus. Registration is \$5 in advance or \$6 the day of the conference. For more information, contact Troy Henson, 282-7476.

Space commercialization is Lunch and Learn topic

Ray Viator of the Houston Economic Development Council (HEDC) will discuss efforts to encourage commercial space activities in Houston at the March 31 Space Systems Technical Committee Lunch and Learn meeting in the Bldg. 3 cafeteria. The meeting begins at 11:30 a.m. For more information, contact Andre Sylvester, x31537, or Chris Cummins, x30354.

AIAA seeks abstracts for May symposium

The Houston Section of the American Institute of Aeronautics and Astronautics has issued a call for abstracts for the 12th Annual Technical Symposium to be held May 14. The theme for 1987 is "Space Frontiers: New Beginnings," and the deadline for submission of abstracts is Friday, April 3. The symposium is open to the JSC community. Abstracts should be 250 words or less, and the presentation should be 10 to 15 minutes using viewgraphs or 35mm slides. Formal publication is not required, but presenters are requested to make handouts available. Submissions should include a company affiliation and telephone number. Abstracts or inquiries may be directed to Walter Lueke, Code ES36, x35939.

BAPCO to meet March 17

The next meeting of the Bay Area PC Organization (BAPCO), the local IBM PC users' group, will be at 7:30 p.m., March 17 at the Holiday Inn on NASA Road One. For more information, call Earl Rubenstein, x33124, or Jack Calvin, 326-2983.

Professional secretaries to meet March 11

The Clear Lake/NASA Area Chapter of the Professional Secretaries International (PSI) will conduct its monthly meeting at 5:30 p.m. Wednesday, March 11, at the Holiday Inn on NASA Road One. Dinner begins at 5:30 p.m., followed by an address by Prebble C. Luthultz on "The Recipe for a Good Meeting." For reservations, contact Carrol Cribbs at 488-7070.

Paris Air Show tour tickets available

A two-week overseas tour, including the Paris Air Show, is being organized by a University of Houston-Clear Lake professor for June 13-28. Participants will explore the extent and significance of the European aerospace industry and new trends in international research, development and marketing. The tour includes stops in Britain, France, Switzerland and Germany. For more information, contact Dr. Roger E. Bilstein, 488-9310.

NASA Night at Astroworld set for April 3

NASA Night at Astroworld has been scheduled for 6 p.m. to midnight April 3 by the Employee Activities Association (EAA). This year, the EAA has contracted to reserve the park for NASA employees, contractors, families and guests. Tickets will go on sale for \$7 each at 10 a.m. March 16 in the Bldg. 11 Exchange Store. Purchasers will be required to present a NASA or contractor badge, and there will be a limit of eight tickets per person. Only 5,000 tickets will be sold in an effort to reduce the length of ride lines.



The JSC Picnic Committee gathered recently to award a \$75 Savings Bond to Dick Richard for his winning theme for the 1987 picnic. The theme for the May 2 picnic is "JSC Proud." Pictured are, front row, from left, Charlotte Lawrence, Mary Lee Meider, Debby White, Linda Poleri, Mary Wiley, Glenda Lancon, Monica Krust, Ann Hammond and Karen Newton. Back row, from left are, Dick Richard, Jim McBride, Brian Bounds, Larry Davis, Dick McMinimy, Dave Heath, Ann Patterson and Mary Mueller.

Eighteenth LPSC to feature Mars exploration session

One of the highlights of the 18th Lunar and Planetary Science Conference scheduled for March 16-20 at JSC is a symposium on the future exploration of Mars.

The Planetary Society-sponsored session will feature Soviet scientists V. Barsukov and V.E. Moroz, and well-known American scientists Bruce Murray and Hal Masursky. Louis Friedman, executive director of the Society, will moderate the symposium, which begins at 8 p.m. Monday in Teague Auditorium, Bldg. 2.

Another special session will look at planetary exploration in the 1990s and beyond. That session, scheduled to begin at 8 p.m. Tuesday in Teague Auditorium, will examine current NASA thinking on missions such as a Mars sample return and the potential for human exploration of the Moon and Mars.

The conference program also includes 29 technical sessions. Discussions will review 584 papers on subjects ranging from Venusian tectonics and Martian geology to solar nebula and asteroids. Papers written in the United States, USSR,

European and Asian countries will be presented.

All but the special sessions will be at the Gilruth Center. Here is a brief session schedule:

- Monday Venus Tectonic Styles, Surface Structures and Geologic History, 8:30 a.m., Gilruth 104; Carbonaceous Chondrites: Inclusions and Matrix, 8:30 a.m., Gilruth Gym; Impact Phenomena: Terrestrial Observations, 8:30 a.m., Gilruth 206; Venus Interior, Models and Surface Geochemistry, 1:30 p.m., Gilruth 104; Carbonaceous Chondrites, Chondrules and the Nebula, 1:30 p.m., Gilruth Gym; Impact Phenomena: Theory and Experimentation, 1:30 p.m., Gilruth 206; Special Session, Future Exploration of Mars, 8 p.m., Teague Auditorium.

- Tuesday Lunar Geoscience Observer and Future Lunar Exploration, 8:30 a.m., Gilruth 104; Halley and Comet Exploration, 8:30 a.m., Gilruth Gym; Mars Geology and Geomorphology, 8:30 a.m., Gilruth 206; Lunar Mare Basalts and Geology, 1:30 p.m., Gilruth 104; Nucleosynthesis: Isotopic Anomalies, 1:30 p.m., Gilruth Gym; The Outer Solar

System, 1:30 p.m., Gilruth G206; Special Session, Planetary Exploration in the 1990s and Beyond, 8 p.m., Teague Auditorium.

- Wednesday Mars and Other Remote Sensing, 8:30 a.m., Gilruth 104; Planetary Differentiation and Crustal Genesis, 8:30 a.m., Gilruth Gym; Cosmic Dust, 8:30 a.m., Gilruth 206; Mars Channels and Volatiles, 1:30 p.m., Gilruth 104; Eucrites and Associates, 1:30 p.m., Gilruth Gym; Extinct-Nuclide Chronology Primitive Components, 1:30 p.m., Gilruth 206; Special Session, The Onset of Accretion, 7:30 p.m., Gilruth 104.

- Thursday SNC Meteorites, 8:30 a.m., Gilruth 104; Lunar and Asteroidal Regoliths, 8:30 a.m., Gilruth 206; the Solar Nebula and Planetary Origins, 8:30 a.m., Gilruth Gym; Lunar Highlands, 1:30 p.m., Gilruth 104; Asteroids and Comets, 1:30 p.m., Gilruth Gym; Ureilites and Iron Meteorites, followed by Cosmic Rays, 1:30 p.m., Gilruth 206.

- Friday Planetary Geologic Processes (General), 8:30 a.m., Gilruth 104; Ordinary Chondrites, 8:30 a.m., Gilruth Gym; Planetary Physics, 8:30 a.m., Gilruth 206.

Viking research spins off space-age insulin pump for diabetics

A space-age insulin pump for diabetics is the most recent NASA spinoff of the Viking project that landed the first spacecraft on Mars a decade ago.

The benefits of the technology became reality in November 1986 when F. Jackson Piotrow of Bethesda, Md., became the first insulin-dependent diabetic to have a new computerized insulin pump surgically implanted in his abdomen at Johns Hopkins Hospital in Baltimore.

The Programmable Implantable Medication System (PIMS) was developed by Johns Hopkins University Applied Physics Laboratory (APL) using technology conceived at Goddard Space Flight Center and made available through NASA's Technology Utilization/Transfer Program.

Piotrow's surgery marked the beginning of a more advanced era of treatment for insulin-dependent diabetics because the computer-controlled system included a long-lived pump that is reprogrammable without having to be removed from the body.

If the PIMS performs as expected, Piotrow will no longer have to inject himself daily with insulin. Instead, the PIMS releases a pre-programmed amount of concentrated insulin into the body at a constant rate on command from the diabetic. To vary the amount of insulin, the individual holds a small radio transmitter over the implant and pushes a specific number corresponding to a program held in the PIMS computer memory.

The device holds about 2.5 teaspoons of insulin—about a three-month supply that can easily be replenished without hospitalization.

The size and shape of a hockey puck, the PIMS communication system included NASA technology that assures reliable programming of the device by radiotelemetry techniques. Much of this technology was obtained from Goddard's Small Astronomy Satellite Program. Goddard also provided program management, technical expertise and \$3 million to stimulate the

transfer of the technology.

"For nearly 20 years, Goddard and APL have worked together in developing spacecraft," said Don Friedman, head of Goddard's Office of Commercial Programs. "With Goddard's experience in electronics and telemetry and with the availability of its facilities, it was only fitting that the Center manage the project."

Friedman said he saw the PIMS project as more than a collaborate effort between the two technology groups.

Gilruth Center News

Call x3594 for more information

Softball registration — Coming in March. Stop by the Recreation Office to pick up information.

Beginning Tennis — Learn the fundamentals of tennis. Eight-week class starts March 16 and meets every Monday from 5:15-6:45 p.m. Cost is \$32.

St. Pat's Run — This 5-kilometer run will begin at 9 a.m. Saturday, March 14. Pre-registration by March 11 costs \$6. Late registration is \$8. T-shirts and awards are included in fee.

SCUBA — Learn to scuba dive and receive an NAUI certification card. Class starts March 23 for 6 weeks and meets every Monday from 6:30 to 9 p.m. and every Wednesday from 7 to 9:30 p.m. Initial fee is \$45. Additional fees will be collected at first meeting.

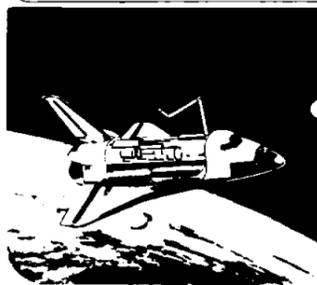
Physical fitness — The next 12-week course of the JSC Physical Fitness Program will be held April 6 to June 26 from 11 a.m. to noon or from 4 to 5 p.m. All NASA and contractor employees and dependents are eligible upon completion of an acceptable physical exam and a maximal treadmill stress test. Call x30302 for more information.

Weight safety — This is a required course for those employees wishing to use the Rec Center weight room. The class will be held March 26 from 8 to 9:30 p.m. Cost is \$4.

Defensive driving — Learn to drive safely and qualify for a 10% reduction in auto insurance rates for the next 3 years. This all-day Saturday class meets from 8 a.m. to 5 p.m. April 25 and May 30.

NASA
Lyndon B. Johnson Space Center

Space News Roundup



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Editor Brian Welch
Assistant Editor Kelly Humphries

Faget receives national space trophy

Dr. Maxime A. Faget has been selected as the first person to receive the Rotary National Award for Space Achievement.

Faget, the former Director of Engineering at JSC, is the President and Chief Executive Officer of Space Industries, Inc., the firm planning to orbit an Industrial Space Facility as early as 1990.

The 500-pound trophy, made entirely of lead crystal by Steuben Glass, stands nearly four feet tall. Almost every process available to Steuben—casting, cutting, blowing and engraving—was used in the creation of the final design. The trophy will be on permanent display at the JSC Visitor Center. Recipients of the award will receive smaller replicas of the trophy, also fashioned from crystal.

The award was established by the local Space Center Rotary Club as a national award for significant contributions to U.S. space exploration. "The creation of this award serves a dual purpose," according to John Francis, a spokesman for the local club. "First, it is intended

to increase the American public's awareness of the value of space research and exploration by focusing attention on the tremendous



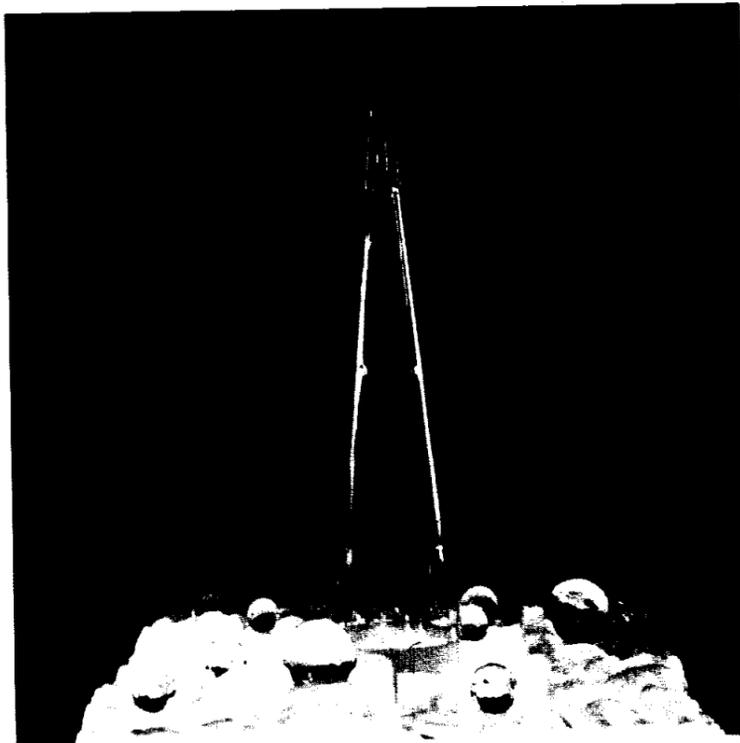
Dr. Maxime A. Faget

to increase the American public's awareness of the value of space research and exploration by focusing attention on the tremendous contributions that the recipient has made. And secondly, it is intended to raise funds to support space educational activities throughout the United States."

Faget was principal designer of the Mercury, Gemini and Apollo spacecraft, and was a guiding light in the design and development of the Space Shuttle.

The award nomination said Faget's "contributions have been absolutely critical to getting people into space. He has worked on all aspects of the problem: aerodynamics and fluid mechanics, materials and thermal protection and life support systems. In addition, Dr. Faget has been an eloquent and consistent advocate of the U.S. space program." Faget retired from JSC in 1982. He is among the original 35 members of the Space Task Group, the organization which eventually grew into the Manned Spacecraft Center, and later JSC.

Faget was selected by a national board of advisors in a six-month nationwide nominating and balloting process. The award will be presented during a black-tie benefit banquet March 12 at the Hyatt Regency Hotel. Persons interested in attending the banquet should call Francis at 333-5986.



Satellite images aid studies of Maya

Satellite images of Mexico's Yucatan Peninsula, Central Guatemala and Belize have led to new discoveries about ancient Maya settlement patterns, environmental settings and natural resource use.

NASA scientists have found evidence of an ancient river plain, sea level changes and tectonic fault lines which may have been important geographic elements in shaping the ancient Maya civilization.

Investigators at NASA's Ames Research Center also are using the satellite imagery to detect Maya water sources, such as natural wells and ponds, and compare their locations to those of ancient Maya ruins. Investigators believe the remote sensing project will help resolve a central question in Maya studies, that being how the Maya built a sophisticated civilization in a relatively resource-poor environment.

Researchers also hope to understand the mysterious cycles of expansion and decline that characterized Maya civilization. Many scholars believe environmental problems, including misuse of resources, may have led to the periods of decline. The Maya civilization, noted for elaborate temples, advanced mathematics and astronomy and large-scale agriculture,

spread across Central America from 2000 BC until the Spanish conquest in the 16th Century.

While remote sensing has been widely used to search for archaeological sites, the NASA project is among the first to use space technology to logical attempt to understand an ancient civilization by studying its environment. "In combining remote sensing, environmental studies and archaeology, this is a pioneering effort," said Ames Project Chief Charles Duller.

Researchers have imaged more than 24,000 square miles of the northern Yucatan Peninsula. A total of 50,000 square miles will be imaged by the end of 1987.

Analysis of Landsat images has shown that ancient Maya settlements in the northern Yucatan were closely concentrated along faults and fracture zones in the Earth. The fracture zones, shallow depressions created by tectonic fault lines in the bedrock, provide close access to subsurface water and have the best soil in the region. Previously, scientists had believed that topographical features in the flat, densely-forested region were too small and scattered to affect Maya settlement patterns. "We've found a very dramatic difference in resource distribution in what was

thought to be a relatively undifferentiated region," said Maya archaeologist Edward Kurjack of Western Illinois University, the principal archaeological collaborator in the project.

In another research area, using SEASAT data, Duller has discovered what appears to be an ancient river plain extending 300 miles across lowland Guatemala. If confirmed by ground-based studies, the finding could explain the location of Tikal, a major Maya trade and ceremonial center from 200 BC to 900 AD. Tikal appears remote and landlocked today.

The dry river plain also would provide evidence of a changing climate which could explain why the Maya abandoned major centers in this region in the 10th century as archaeological findings suggest.

A third major focus of investigation is the Yucatan Peninsula's northern coastline. Scholars have long known that the sea level along the Yucatan rose during Maya times, inundating the coast and increasing the salinity of the subsurface water table. The rise in sea level curtailed the important Maya salt trade as the salt flats became submerged, shut down coastal settlements and may have affected agriculture far inland.

Researchers have found that the satellite images show natural linear features marking former coastlines beneath the water, enabling mapping and dating of various changes in sea level. Duller and Kevin Pope, a paleoecologist now at Ames, have begun analysis of the coastline changes.

In the Yucatan, which has mainly seasonal surface water, the NASA researchers are comparing imagery from the wet and dry seasons to determine the distribution of surface water. Coupled with ground-based studies of how the climate has changed, the research will lead to a determination of how much water might have been available during Maya times. Scientists could then determine which areas might have been optimal for agriculture and how many people the land could have supported. This could help shed light on the periods of Maya decline.

Some scholars believe the Maya may have exhausted the soil in attempting to support a large population. The Maya are thought to have practiced slash-and-burn farming, which leads to water runoff, erosion and depletion of nutrients, unless the land is allowed to lie fallow for 8 out of 10 years.

NASA researchers had initially

hoped Landsat would detect ruins directly. They had thought vegetation growing on ruins would be weaker or more stressed, since they have poorer access to water, and thus appear in a different shade in the infrared images from surrounding vegetation. But the researchers found that in the Yucatan all vegetation appears highly stressed. Duller believes that radar imagery will be able to penetrate the dense vegetation covering many sites.

Satellite imagery has been highly effective for locating cleared ruins. This capability is significant because much of the Yucatan is only now being mapped and locating even excavated sites from the ground has been extremely difficult since the region is flat, thickly forested and has few roads. "There were explorers in the Yucatan for a hundred years. Sites were discovered, lost to memory, rediscovered, named and renamed," Kurjack recalls.

Ames researchers have mapped large portions of the 62-mile raised road from Coba to Yaxuna, which is by far the longest of the many elaborate causeways built by the Mayas to connect ceremonial centers.

Brightest since 1604

NASA satellite studying supernova

A telescope aboard a 9-year-old orbiting satellite continues to monitor the intense emissions of ultraviolet radiation from a recently discovered exploding star, called a supernova, located 163,000 light years from Earth.

Scientists at NASA's Goddard Space Flight Center (GSFC), say that the International Ultraviolet Explorer (IUE) satellite has performed superbly since Feb. 24, when regularly scheduled operations were interrupted to focus IUE's 18-inch telescope, the largest now operating in space, on the supernova in the Large Magellanic Cloud, a neighbor galaxy of our own Milky Way.

Supernova 1987a, visible to the naked eye from Earth's Southern Hemisphere, is the brightest seen since the year 1604, and the first bright supernova since the invention of the telescope around the year 1609.

"We have contingency plans on file for special events like the supernova," explained Dr. Yoji Kondo, IUE Project Scientist at GSFC. Kondo said interested scientists

around the nation and overseas submit so-called "target-of-opportunity" proposals to use the IUE telescope on new exploding stars, comets and other unusual objects. Thus, the satellite operators have the necessary information on hand to plan the telescope operations when astronomers spot an event.

Dr. Robert P. Kirshner, astronomy professor, Harvard University, is directing the IUE scientific observations of the new supernova. He earlier had submitted a target-of-opportunity proposal to study future bright supernovae with the IUE. "This is a real opportunity to explore a whole new region of a supernova's spectrum," says Kirshner, who explains that previous supernovae, since IUE was launched in January, 1978, were not bright enough to study at the shortest ultraviolet wavelengths accessible with the IUE telescope and spectrograph.

"Earlier supernovae were studied at longer ultraviolet wavelengths with IUE, but the measurement data on those objects "only hint at"

what is being recorded on the new supernova by IUE, since the new object is much brighter."

The first observations of the new supernova, made with IUE on the afternoon of Tuesday, Feb. 24, revealed that it is an intense source of ultraviolet radiation. According to Dr. George Sonneborn, staff astronomer at Goddard's Observatory Telescope Operations Center, "although we made a very short time exposure, just 15 seconds, the supernova is so intense that the first spectrogram was overexposed." Dr. Sonneborn is with the Computer Sciences Corporation, which assists in operating the satellite under contract to NASA.

Ultraviolet rays are a form of light with shorter wavelengths and greater energy than ordinary visible light. Because ultraviolet rays are absorbed in the Earth's atmosphere, the rays cannot be seen with telescopes on the ground. Astronomers must study these rays from space.

Explaining the significance of the discovery of the intense ultraviolet radiation of the new super-

nova, Kirshner said, "the new supernova is believed to represent the explosion of a star much more massive than the Sun. Earlier in the star's lifetime, according to current astrophysical thinking, it must have ejected a great deal of gas that still surrounds it. The intense ultraviolet light found by IUE will be energizing the circumstellar gas around the supernova, and IUE will tell us what happens under these circumstances."

Astronomers believe that new observations from IUE, besides revealing the nature of ultraviolet radiation from a supernova and its effects on surrounding matter, will provide precious new data on the "galactic corona," a poorly-explored hot outer atmosphere of our own Milky Way. The Large Magellanic Cloud, the small galaxy where the supernova is located, is also thought to have a corona, which also will be explored thanks to the supernova.

Dr. Blair D. Savage, professor of astronomy at the University of Wisconsin, Madison, who helped

discover the galactic corona, said the scientific importance of the IUE observations of the new supernova for exploring the galactic corona cannot be underestimated. "This spectacular event provides an unparalleled opportunity to study the physical nature and composition of the cool and hot gaseous matter situated in and around the Milky Way and the Large Magellanic Cloud."

The observation of spectral absorption lines due to the galactic corona in the ultragrams obtained by IUE indicates the supernova is probably beyond the corona and indeed located in the Large Magellanic Cloud, as astronomers have generally assumed. However, further analysis is needed to confirm this deduction.

"It should be noted," Kondo said, "that this satellite is nine years old and is still operating without some of its original gyros and is long beyond its design lifetime. This shows we can still do first class space science with existing equipment."

Roundup Swap Shop

All Swap Shop ads must be submitted on a JSC Form 1452. The forms may be obtained from the Forms Office. Deadline for submitting ads is 5 p.m. the first Wednesday after the date of publication. Send ads to Roundup, AP3, or deliver them to the Newsroom, Bldg. 2 Annex, Room 147. No phone in ads will be taken.

Property & Rentals

Sale: Lake Livingston Memorial Point lakeview lot, utilities, security, restrictions, below assessed value, owner finance. 946-3945.

Sale: Friendswood Forest 1-acre lot, near intersection of FM518 and FM528, utilities, 8 mi. from JSC. Dale, x39039 or 481-0046.

Sale: Baywind II 1-1 condo, FPL, mirrored walls, miniblinds, fans, W/D connections, assumable loan. 471-6814.

Sale: Splendor heavily wooded 2-acre corner lot, approx. 40 mi. NE of Houston, all utilities available, quiet surroundings, clean air, \$2,000 down, total \$16,000, owner finance balance at 6% (.5%/mo. on unpaid balance). 332-0047.

Rent: 3-1.5-2 house, brick, C/A/H, drapes, miniblinds, appliances, fenced, \$500/mo., 2409 Dewberry, Pasadena. 998-8252.

Sale: Camino South 3-2-2, 1,850 sq. ft., DR, den w/FPL, cathedral ceiling, rec room w/bay window, wet bar, fans, walk-in closets, fenced, \$76,320 OBO, lease w/option to buy. Tom, x38162 or 280-0689.

Rent: League City townhouse on marina, 2-2, FPL, loft, W/D, tennis, pool, no smokers, no pets, available April or May 1, \$800/mo. plus utilities, unfurnished, will consider furniture. 554-6907.

Sale/lease: Nassau Bay, 2,200-sq.-ft. townhouse, new carpet, paint, large garage, deck, atrium, 20-ft. FPL, \$890/mo. or \$119,900. Jerry, x38922 or 474-4310.

Sale/lease: Forest Bend 3-2-2 brick, 1,550-sq.-ft., FPL, fenced, clean, \$450/mo. or \$54,900 (8% FHA). 332-4774.

Sale/lease: El Dorado Way 2-2 condo, W/D, \$45,000 or \$425/mo. plus \$200 deposit. Rich, 480-1218 or 36156.

Sale/lease: CLC 2BR Baywind condo, all appliances, W/D connections, fans, storage room, pool, etc., next to NASA. 488-0719.

Rent: Galveston Gulf-front condo at the Victorian, sleeps 6, fully furnished. Glen, 280-8644.

Lease: Lake Livingston waterfront house, 3-2, sleeps 8, fully furnished, pier, ex. fishing, skiing, swimming, weekend and weekly rates. 482-1582.

Sale: Horseshoe Lake Estates, Romayor, TX, 3-1, A/C, furnished, 1 acre, fishing lake, Trinity River, Hwy. 105 between Cleveland and Rye. 479-5594 or x33138.

Lease: West Galveston Island beach house, 3-2, furnished, day/week/mo. Ed Shumliak, x37686 or 482-7723.

Lease: Condo on Clear Lake, 24-hr. security, pool, tennis, 2-1, \$365 plus utilities. 480-5582 or 482-7156.

Lease: Heritage Park/Friendswood, new section 3-2-2, FPL, large kitchen, microwave, fence, fan, new paint, refrig., \$550-/mo. 482-6609.

Sale/lease: El Dorado Trace condo, 2-2.5-2, fully furnished incl. stereo, TV, waterbed, 2 phones, cable, paid utilities, rent \$700, sell \$54,500. 538-2262 or x33555.

Sale: Friendswood/Wedgewood 3-2-2, large LR, den, FPL, covered patio, new carpet, lots of extras, \$56,500. 482-9168.

Sale/lease: Austin/UT condo, 1-1, 4 blocks to law school, assume loan, no equity. B. Craig, x34158 or 420-2936.

Lease: Heritage Park 3-2-2, all elec., 1,450 sq. ft., fenced, fans, on cul-de-sac, near park, pool, \$495/mo. Mike, 280-1714 or 480-4507.

Cars & Trucks

'78 Camaro Type LT, 350, 4-barrel, 4-spd., dual exhaust, positraction, radial TAs, gas shocks, deluxe interior, factory gauges, new clutch, Z28 suspension, 85K mi., \$2,900 OBO. 488-3314 or x32567.

'77 25-ft. Champion Titan motor home, 33K mi., clean, sleeps 6, \$10,000 OBO. 559-2331.

'70 Bonneville, '78 TransAm 400 engine, PW, power seats, runs well, needs 2 tires to pass inspection, \$600. Neal Nelson, Pasadena, 946-2628.

'79 VW Scirocco, AC, AM/FM/cassette, new battery and tires, one owner, \$2,300. Gordon, 326-3130.

'79 Chevy Suburban Silverado, dual A/C, 3 bench seats, trailer package and hitch, 350 V8, good cond., \$3,800. 488-7238.

'81 Honda Accord sedan, 4-dr., 5-spd. manual, AM/FM, A/C, runs great, 100K mi., \$3,500 OBO. John, x38942, 996-0689.

'83 Ford Escort Gl, brown, 2-dr., hatchback, original owner, non-smoker, ex. cond., 28K mi, brown interior, \$2,500. 480-6541.

'84 Mercury Topaz, 50K mi., auto., A/C, PS, AM/FM stereo, cloth seats, \$3,950. 554-5514.

'84 Pontiac Fiero, red, 4-spd., 21K mi., extended warranty, \$6,200. Marie, x38875 or 480-4507.

'80 Pontiac Bonneville, V6, 4-dr., clean, 86K mi., \$3,000. Rick, 480-1218 or x36156.

'82 Corvette, red, red interior, loaded, glass tops, Eagle GT tires, garage kept, 56K mi., \$11,000. 946-2439.

'84.5 Toyota Supra, orig. owner, auto., leather, sunroof, auto. air, cassette, show room cond., garage kept, \$9,800. 282-4981 or 280-9699.

'85 Mitsubishi Montero, 4WD, sport edition, AM/FM/cassette, tinted windows, \$900 and take over payments or \$8,500. 280-9062 or 554-4228.

'78 Camaro, A/C, PS, PB, AT, tilt wheel, chrome custom wheels, clean, \$2,200 OBO. Bill Wood, x33838 or 554-2283.

'68 Mustang, convertible, ex. cond., candy apple red, \$4,950. Tim, x38843 or 486-9318.

'68 Mustang coupe, good cond., A/C, 289 auto., \$2,800. Tim, x38843 or 486-9318.

'82 Buick Riviera, V8, navy blue metallic, fully equipped, clean, ex. cond., 68K mi., \$6,500. Dick, x30962 or 482-1535.

'86 black Camaro Z28 Iroc, ex. cond., loaded, was \$18,800, now \$15,800 OBO, added new tires, alarm, radar detector. Jim, 282-4264 or 480-7440.

'76 Datsun 280Z, 79K mi., mags, auto., A/C, over 75% restored, \$2,200 OBO. Wayne, x37389 or 335-1366.

'84 Ranger pickup, V6, XL, LB, A/C, auto., PS, tilt, AM/FM, tow package, 43K mi., \$5,199 OBO. Wayne, x37533 or 471-2392.

'80 Pontiac Phoenix, 4 cyl., 4r-spd, 5-dr. hatchback, A/C, FM/tape, PS, PB, 66K mi., orig. owner, good radials, \$950 OBO. 488-3250.

'72 Grand Prix, 455, runs good, needs body work, \$500 OBO. 474-9338.

'66 Volvo station wagon, classic, one-owner, perfect for restoration, not running, \$100. Dave Pitts, x35066 or 488-3276.

'52 Ford 8N tractor w/3-pt. hitch, \$2,100. 438-2299.

'85 Jeep Cherokee, 4 x 4, V6, 5 spd., PS, PB, AC, AM/FM, tilt, roof rack, cloth seats, ex. cond., \$9,998. 480-6805.

Boats & Planes

Customized bass boat, 14-ft. Kingfisher, tilt trailer, spare tire, anchor, horn, lights, batteries, depth-finder, lots more. Karen, x34284 or 280-8029.

'73 14-ft. V-bottom runabout, 50-hp. Mercury outboard, running lights, bilge pump, new control cables, trailer completely refurbished last season, motor needs new gear in lower unit, \$600 OBO. 486-5880 or 332-4809.

Cycles

'80 Kawasaki 1300 touring motorcycle and '86 Shoreline utility trailer, full dresser bike w/stripes, AM/FM/cassette, Fox radar detector, 2 helmets, cover, ex. cond. David, x39564 or 538-1002.

Men's 30-in. Murray 3-spd. bicycle, generator headlight and taillight, good cond., \$50. Mike, 480-1003.

'83 V-45 Magnum motorcycle, like new, \$1,600. Troy, 488-7758 or 538-1878.

'83 Honda Nighthawk CB550, ex. cond., one owner, less than 2K mi., shaft drive, crash bar, \$1,500 OBO. Ray, x31484 or 280-8563.

Audiovisual & Computers

Commodore 1541 disk drive, \$140; 801 printer, \$75; both for \$200. 554-5514.

Sony Hi-Fi Stereo Super Beta VCR, wireless remote, less than 1 yr. old, factory warranty, was \$750, now \$300. Walker, 486-5313.

Car stereo, Delco AM/FM/cassette, built-in equalizer, ex. sound separation, quality, fits late model GM cars, \$150. Walker, 486-5313.

Teac A-106 stereo dolby tape deck, ex. cond., \$75. Gerry, x39805, 486-0889.

Disk drive Commodore 1541, \$140; printer TP-1 SCM LTR quality \$150, printer interface, MW302C Microworld Electrolux, \$60; wood computer table w/shelf, \$40; wood printer table, \$40; Comm-64 "SUPERBASE" data manager, \$40; "PAPERCLIP" word processing, Comm-64, CBM, PET, \$40. 334-1345.

Big board 2-80 computer, dual 8-in. disk drives, monitor, keyboard, \$450. 334-4894.

Commodore 128 computer, disc drive, monochrome monitor, parallel printer interface cable, software. 481-0468.

Phone-Mate answering machine, uniden cordless telephone. 481-0468. Ohio Scientific personal computer,

color, 1 floppy disk drive, 8 channel analog input, 2 channel analog output, or x31912.

Color Computer, 32K, disk drive, cassette, assembler, games, complete set of Rainbow magazines, all for \$100. Dave Pitts, x35066 or 488-3276.

Zenith 19-in. color TV, ex. cond., hardly used, \$200. Joe, x31597 or 996-1667.

Household

Waterbed, king size flotation system, comforter, pillows, was \$1,200 now \$475. 280-9062 or 554-4228.

Bookcase, 4 mos. old, oak, 7-ft. tall, 6-ft. wide, 12-in. deep, was \$385 now \$250 OBO. 474-9338.

Full-sized mattress, box springs, frame, Sealy firm, \$100; student desk, Bassett, four drawers, \$50. Joyhn, x31056.

Broyhill dining set w/buffet, Mediterranean/Spanish style, was \$1,850, now \$1,250; office desk and chair, were \$1,595, now \$800; couch and loveseat, Fingers, were \$1,195, now \$700. Nick, 554-4970 or x33476.

Basset baby crib, was \$295, now \$150; cradle, \$75; playpen, never used, \$35; Turkish carpets, 1 year old, were \$450 ea., now \$250 ea.; 3 suitcases, \$30. Nick, 554-4970 or x33476.

Queen-size waterbed, motionless, pine frame, 6 drawers, 5 mo. old, was \$700, now \$500. Hansen, x38033.

Woodstick coffee table, glass top, unique design, imported from Brazil, ex. cond., \$98. Valerie, x38385.

Six-ft. curio cabinet, glass shelves, lights, mirrors, \$75; stereo cabinet, glass door, \$25; parson's bench, \$25; 6-ft. bookcase, \$10. Lynda, x38296.

Four-pot set of Faberware, \$25; Corolle serving for 4, incl. some extras, \$20; silverware serving for 8, \$5. Lynda, x38296.

Six-place California Cooperage spa, acrylic foam insulated, cedar rolltop cover, 350-gal. 488-2316.

King-size waterbed, headboard, mattress, heater, frame, pedestal, pine, \$200 OBO. Mark, x32935 or 488-7492.

Carpet, 6 x 9-ft., copper brown, good cond., \$25. Chuck, x31701 or 333-3763.

Oster kitchen center, 12 spds., blender, mixer, meat grinder, dough maker, food crafter, like new. 488-2822.

Kenmore gas range, 2 ovens, \$100. Chris, x30794 or 941-0138.

Industrial drawing table, Hamilton, 3 x 5-ft. top, D-size flat drawer, 1 x 2-ft. utensil drawer w/lock, ex. cond., \$180 OBO. Pat or Jeff, 480-4158.

Whirlpool washer, dryer, both ex. working cond., 3.5 yrs. old \$200 for both. Ken, x32517.

GE Magic Chef microwave, needs cook relay, 3 yrs. old, \$50. Becky, x36530 or 944-2371.

Washer, Speed Queen, heavy duty, large capacity, runs but needs repair, \$75 OBO. 554-2908.

Hot water heater, 15 gal.; 15-ft. Formica bar top; 24 x 30 x 2-inch maple cutting board; new wood chairs, birch, 4-ton A/C, used 1 season. 554-2908.

Office swivel chair, beige and brown, fabric seat, vinyl arms and back, ex. cond., \$50. Smith, x37135 or 488-0010.

Photographic

Canon Speedlite Flash model 188A, \$35; Canon FD 50/1.8 lens, \$25; Canon case for AE1-P, \$10, all ex. cond. James, x32632 or 486-4378.

Wanted

Want engineers for speech recognition experiments, send name and phone number to Mark, EE2. For info, call x30160.

Want bricks, stepping stones, borders, mulch, compost, etc. for garden. Kellie, 480-3377.

Want Mistral superlight windsurfer. Bullock, x30026 or 488-6526.

Want non-working window air conditioners, free removal. 483-1825.

Square stern canoe, will pay up to \$150. Sean, 480-8190 or 335-1711.

Want Miyazawa flute. 488-4915.

Want roommate to share 2-2 condo, \$250/mo., W/D, \$75 deposit. Rick, 480-1218 or x36156.

Want musicians wanting to jam with drummer, prefer rock, jazz, blues. Joe, x31597 or 996-1667.

Pets & Livestock

Free American Eskimo dog to loving home, 3 yrs. old, has shots, UKC purple ribbon registered, needs room to run, play. 944-5944.

Lhasa Apso, male, neutered, 2 yrs. old, no papers, loves to play, needs good home, room to run. 409-848-1282.

Siamese kittens, purebred. Steve

Messersmith, x32530 or 326-2174.

German shepherd, male, 6 yrs. old, dog house. T.L., x31621.

Musical Instruments

Three-quarter violin, BO, good for band practice for young student. 944-5944.

Fender Deluxe Reverb guitar amplifier, Sears 60 BXL Bass practice amp. 488-7909.

Hammond Organ model CV, 2 manual, full pedals, suitable for home or church, ex. cond., \$2,500. 944-1302.

Altec Voice of the Theater speakers, two 15-in. L.F. speakers, 24-in horn in enclosure w/wheels, \$150. John, x31056.

Clarinet outfit w/case, 2-yrs.-old, good cond., not used long, was \$425, now \$175. 334-1345.

Lost & Found

Found gold cat, tag reads M. Herrera. Joan, x34618 or 486-1058.

Miscellaneous

Octa-Gym, ex. cond., was \$140, now \$70. 332-0047.

Records, pop, country, easy listening, misc., ex. cond., most played only once, \$2-\$3. Valerie, x38385.

Rear chrome bumper for Ford van. 488-2822.

U.S. stamps, singles and plate blocks, 1940-80, mint cond., good prices. Chuck, x31701 or 333-3763.

Decorative horns, 6-ft. Joan, x34618 or 486-1058.

Approx. 270 ft. of 5-ft. chain link fence, 2 walk gates, 1 20-ft. drive gate, all hardware, \$500 OBO. 554-4211.

Used VW parts, some performance, complete engine. Ray, x30823 or 554-5434 before 8:30 p.m.

Knitting machine for hobbyist of professional, computerized, Toyota, access., instruction manuals, was \$1,000, now \$650, ex. cond. Smith, x37135 or 488-0010.

Ladies solitaire diamond ring, 0.45 carats, platinum body, appraised at \$1,350, now \$700. Scott, x38497 or 488-1044.

Wedding gown, hoop-slip and veil, size 7, worn once. \$295. 479-7171.

Formals, various styles and colors, size 2-4, all ex. cond., \$40-\$70. Kelley, x32631.

TV stand, \$30; lawn mower, \$60; desk, \$35. Lorraine, 480-3377 x64.

Remington 1100 12-gauge shotgun w mod. vented rib, 28-in., never used, was \$350 now \$275. 585-5076.

Baby swing, \$15; walker, \$4. 482-1505.

Lawnmower, ex. cond., \$75. 559-1723.

Motorized treadmill exerciser, variable speed, adjustable incline, still in orig. crate, \$200. Dave, 585-3404.

Cookin' in the Cafeteria

Week of March 9 — 13, 1987

Monday — Chicken Noodle Soup; Wieners & Beans, Round Steak w/Hash Browns, Meatballs & Spaghetti (Special); Okra & Tomatoes, Carrots, Whipped Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Beef and Barley Soup; Beef Stew, Shrimp Creole, Fried Chicken (Special); Stewed Tomatoes, Mixed Vegetables, Broccoli.

Wednesday — Seafood Gumbo; Fried Perch, New England Dinner, Swiss Steak (Special); Italian Green Beans, Cabbage, Carrots.

Thursday — Cream of Chicken Soup; Turkey & Dressing, Enchiladas w/Chili, Wieners & Macaroni, Stuffed Bell Pepper (Special); Zucchini Squash, English Peas, Rice.

Friday — Seafood Gumbo; Baked Cod, 1/4 Broiled Chicken w/Peach Half, Salisbury Steak (Special); Cauliflower au Gratin, Mixed Vegetables, Buttered Cabbage, Whipped Potatoes.

Week of March 16 — 20, 1987

Monday — Chicken & Rice Soup; Wieners & Sauerkraut, BBQ Ham Steak, Steak Parmesan, Beef & Macaroni (Special); Green Beans, Carrots, Au Gratin Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Tomato Soup; Potato Baked Chicken, BBQ Spare Ribs, Mexican Dinner (Special); Squash, Broccoli, Ranch Beans, Spanish Rice.

Wednesday — Seafood Gumbo; Liver & Onions, Baked Turbot, BBQ Ham Steak, Baked Meatloaf w/Creole Sauce (Special); Beets, Brussels Sprouts, Green Beans, Whipped Potatoes.

Thursday — Beef & Barley Soup; Chicken & Dumplings, Corned Beef w/Cabbage, Smothered Steak w/Cornbread Dressing (Special); Spinach, Cabbage, Cauliflower au Gratin, Parsley Potatoes.

Friday — Seafood Gumbo; Pork Chop w/Yam Rosette, Creole Baked Cod, Tuna & Salmon Croquette (Special); Brussels Sprouts, Green Beans, Buttered Corn, Whipped Potatoes.

Week of March 23 — 27, 1987

Monday — Cream of Celery Soup; Braised Beef Ribs, Chicken a la King, Enchiladas w/Chili, Italian Cutlet (Special); Navy Beans, Brussels Sprouts, Whipped Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Beef & Barley Soup; Turkey & Dressing, Country Style Steak, Stuffed Cabbage (Special); Corn Cobbette, Okra & Tomatoes, French Beans.

Wednesday — Seafood Gumbo; Catfish w/Hush Puppies, Roast Pork w/Dressing, Pepper Steak (Special); Broccoli, Macaroni & Cheese, Stewed Tomatoes.

Thursday — Cream of Tomato Soup; Beef Tacos, BBQ Ham Slice, Hungarian Goulash, Chicken Fried Steak (Special); Spinach, Pinto Beans, Beets.

Friday — Seafood Gumbo; Liver & Onions, Deviled Crabs, Roast Beef w/Dressing, Tuna & Noodle Casserole (Special); Whipped Potatoes, Peas, Cauliflower.

Week of March 30 — April 3, 1987

Monday — French Onion Soup; Beef Chop Suey, Polish Sausage w/German Potato Salad, Breaded Veal Cutlet (Special); Okra & Tomatoes, Green Peas. Standard Daily Items: Roast Beef